



DEPARTMENT OF THE NAVY  
HEADQUARTERS UNITED STATES MARINE CORPS  
WASHINGTON, D.C. 20380

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From: Commandant of the Marine Corps

Subj: REVISED MARINE CORPS REQUIRED OPERATIONAL CAPABILITY (ROC)  
NO. INS 1.01C, SHOULDER-LAUNCHED MULTIPURPOSE ASSAULT  
WEAPON (SMAW)

Ref: (a) MCO 3900.4C  
(b) CMC ltr RCC-25-yks of 1 Sep 81

Encl: (1) ROC No. INS 1.01C SMAW

1. In accordance with the procedures set forth in reference (a), the subject revised ROC (enclosure (1)) is hereby established and promulgated. This ROC replaces and supersedes ROC No. INS 1.01B (SMAW) which was promulgated by reference (b).

2. There is a continuing requirement to upgrade the quality of all operational requirements documents in order to make them more useful. In consonance with this effort, all comments or recommendations regarding the content of this requirement document should be made within the guidelines set forth in reference (a) and addressed to the Commanding General, Marine Corps Development and Education Command, Quantico, Virginia 22134-5001. Requests for changes to the distribution list should be made to the Commandant of the Marine Corps (RDA).

*Ray M. H.*  
RAY M. H.  
Major General  
Deputy Commandant  
of the Marine Corps

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## REQUIRED OPERATIONAL CAPABILITY (ROC)

NO. INS 1.01C FOR A

### SHOULDER-LAUNCHED MULTIPURPOSE ASSAULT WEAPON (SMAW)

1. STATEMENT OF THE REQUIREMENT. <sup>*This document describes*</sup> The Marine Corps ~~has a~~ requirement for a high payload-to-weight ratio assault weapon with a family of rounds that will enable the Marine infantryman to destroy a variety of ground targets found on the modern battlefield. These targets include field fortifications (bunkers), urban structures, automatic weapon positions, and armor. The SMAW, with the dual mode assault round, has achieved required initial operational capability (IOC) of 1st qtr FY85. The required IOC for the high explosive antiarmor (HEAA) round is 1st qtr FY88 (FY87 desired). Other rounds will be included in the family as their essential characteristics are defined. Future revisions to this ROC will identify these requirements.

### 2. THREAT AND OPERATIONAL DEFICIENCY

a. Threat. Potential enemy threats confronting the Marine Corps in the near-to-long-range period are described by the Marine Corps Long-Range Plan (MLRP) and the Marine Corps Midrange Objectives Plan (MMROP).

b. Operational Deficiency. In the modern combat environment and the one envisioned for the future, the emphasis on mobility, speed, maneuverability, and sophisticated weaponry will place a commensurate emphasis on protective structures for men and equipment. These field and urban area fortification targets are the type built within the tactical limitations of time for specific terrain defense, rather than extensive fixed installation-type defenses requiring sophisticated engineering/construction techniques. They pose a threat in all types of tactical situations, from simple ambush sites encountered in counterinsurgency operations to more deliberate beach or avenue-of-approach defenses encountered in a full-scale conventional warfare attack. Urban terrain, moreover, affords a multitude of materials and techniques for establishing field fortification-type defenses, and the threat of these targets to Marine Corps forces is expected to increase dramatically with the increasing urbanization of the littoral areas of the world. Current intelligence indicates that field/urban-type defenses and fortifications are likely to consist of earth/sand/timber composite structures, earth/sand/concrete composite structures, and brick/masonry/sandbag composite structures. Despite the overall improvements achieved in deliverable firepower over the last two decades, the Marine infantryman still does not possess a weapon capable of defeating field and urban area fortifications as well as armored vehicles. The rockets and recoilless weapons in the current inventory are marginally effective in antfortification and antipersonnel roles. Present manportable

10

HEAA ammunition warheads, while capable of penetrating hard positions, are inadequate in terms of behind-the-target effects. Basically, the infantry commander does not have an adequate mix of assault ammunition which is optimized for the array of targets facing him on the battlefield.

### 3. OPERATIONAL AND ORGANIZATIONAL CONCEPTS

a. Operational Concept. Marine amphibious forces of the future can expect to be employed at all levels of warfare in geographical areas exhibiting extremes of physical environment and climatic conditions. With the increasing importance of the city in both developed and developing nations, a growing segment of military planners have come to agree that future weapons must be assessed to ensure the achievement of tactical goals in the urban environment. The combat qualities of the SMAW and its family of rounds will provide the infantry with a substantial increase of assault combat power to defeat enemy fortifications, armored vehicles, and most tanks used by conventional and mechanized forces.

#### b. Organizational Concept

(1) The SMAW and its family of rounds will be employed in the assault section of the weapons platoon of the rifle company to engage and defeat ground targets to include field fortifications (bunkers), automatic weapon positions, urban structures, armored vehicles, and tanks (except for frontal glaciis hits on newer Soviet tanks). The initial basis of issue for the weapon in the reuseable launcher configuration is six per rifle company. The term "defeat" as used in this paragraph is defined as:

(a) A firepower kill that constitutes neutralization of the defending weapon and crew within the target.

(b) A structure kill that denies the enemy a useable fortified position from which he can interfere with friendly force missions.

(c) A vehicle kill that denies mobility.

(2) Operation of the SMAW shall not involve the application of unusual infantry skills, training, or logistic support requirements.

### 4. ESSENTIAL CHARACTERISTICS. The performance characteristics essential for the SMAW are as follows:

a. The SMAW shall be an "all-up" system ready for use without field assembly.

b. The weapon shall be readily transportable and operable by one man.

c. The SMAW, with dual mode assault round in a ready-to-fire configuration shall not weigh more than 30 lbs (13.5kg).

d. The SMAW with HEAA round in a ready-to-fire configuration shall not weigh more than 34 lbs (15.3 kg; 30 lbs desired).

e. The physical dimensions shall be such so as not to interfere with its portability in tactical vehicles and helicopters in the shoulder sling carry position.

f. The observable firing signature of the SMAW shall be minimal; i.e., no greater than that of a typical shoulder launched rocket system.

g. The backblast associated with firing shall be minimal. It is desired that the weapon permit employment, with precaution, from an enclosed position of at least 4 meters x 4 meters with ventilation equivalent to an open door (no less than 2 square meters).

h. The SMAW shall be capable of mounting a night sight in order to engage targets under reduced visibility (fog, smoke, rain, low light), and the operator shall not be required to make reference to aiming tables or charts for accurate firing. It is desired that the SMAW be capable of employment under typical night visibility conditions without serious degradation of accuracy.

i. The SMAW shall be capable of accurate, predictable hits at slant ranges of 250 meters for launch angles from 15° above the horizon to 15° below the horizon. At slant ranges of 100 meters or less, the weapon shall be capable of accurate, predictable hits for launch angles from 60° above the horizon to 60° below the horizon.

j. Waterproofing and dustproofing of the weapon shall be optimized in order to:

(1) Preclude sand and dust contamination of interior surfaces and operating mechanisms.

(2) Ensure an operable and safe system after immersion in salt or fresh water.

k. Firing noise shall meet the requirements of MIL-STD-1474B.

l. The SMAW shall have a total system functional reliability (all components function as intended) of 0.95.

m. The SMAW with the dual mode warhead (MK 118 Mod 0) shall have a probability of single shot kill (PSSK) of 0.7 at ranges

from 25 meters to 200 meters and shall have not less than PSSK of 0.5 at 250 meters against assault targets described below:

(1) Field fortifications (bunkers) characterized by at least one meter thick sidewall sand/earth/concrete composite material construction.

(2) Field fortifications (bunkers) characterized by at least 1 meter thick sidewall sand/earth/concrete composite material construction with the concrete portion of the composite not more than eight inches thick.

(3) Urban fortified targets characterized by sidewall construction of at least three rows of brick and mortar (.33 meters) and one sandbag layer.

n. The SMAW with the dual mode assault rocket warhead (MK 118 Mod 0) shall have a minimum single shot hit probability of 0.60 for a 1-meter-high by 2-meter-wide target at a maximum recommended employment range of 250 meters when fired from a fixed position at the targets described in the preceding paragraph.

o. The SMAW with the HEAA round shall have a minimum single shot hit probability of 0.75 for a 2.3 meter high by 2.3 meter wide target at a maximum recommended employment range of 250 meters when fired from a fixed position, and a 0.30 at a range of 500 meters.

p. The HEAA round penetration of rolled homogeneous armor (RHA) per MIL-STD-19560 shall not be less than 600mm (800mm desired) at zero degree obliquity.

q. It is desired that the sighting system permit firing when the gunner is in a defilade position.

r. A spotting rifle is initially required to enhance gunner accuracy and training. Other range estimating systems should be considered for future models as a product improvement.

s. The weapon and/or its ammunition must be capable of being stored for periods of not less than five years (ten years desired) without significant loss of reliability and must be reactively impervious to environmental temperatures ranging from -40°F (-40°C) to +140°F (+60°C).

t. Each type of round developed for the SMAW must be compatible with the existing launcher, optical sight, and firing mechanism.

u. Nuclear hardening is not required for this weapon system.

5. INTER/INTRAOPERABILITY AND STANDARDIZATION REQUIREMENTS The introduction of this weapon will affect Mission Area-211.1



(Infantry Systems/Light Weapons). It is a unique one-of-a-kind weapon, fielded only in the U.S. and is compatible with all other Marine Corps weapons and systems.

## **6. RELATED EFFORTS**

a. The U.S. Army user community, represented by the Training and Doctrine Command (TRADOC) and the U.S. Army Infantry School (USAIS), has developed a requirement in the form of an LOA between TRADOC and the U.S. Army Material Command (AMC) for a Military Operations in Urban Terrain (MOUT) Assault Weapon.

b. The Marine Corps monitored several U.S. Army development programs that had been related to the SMAW development program inasmuch as certain component technology was applicable. The Lightweight Recoilless Gun (LWRG) and the Minimum Signature Envelope Recoilless (MISER) programs are two recoilless propulsion exploratory development programs which were conducted at the U.S. Army Armament Munitions and Chemical Command (AMCCOM). The LWRG is a conventional hot gas recoilless system, and the MISER is a trapped-piston launch system that has a very low blast and noise signature. Other systems, including the Special Hard-Target Assault Weapon, Lightweight (SHAWL) and the Liquid Discharge Eject (LDE) Weapon System, were developed by the U.S. Army Missile Command (MICOM). The SHAWL is a high explosive follow-through warhead concept which employs the Viper Launcher, rocket motor, and some warhead hardware. The LDE rocket, like the MISER, has a very low blast and noise signature. All of these Army systems are exploratory development efforts requiring additional development and/or have limited effectiveness against the target spectrum defined in this requirement document. The U.S. Army has recently decided to buy the 84mm AT4 light antiarmor weapon (LAW). It is a disposable round of ammunition weighing 14.6 lbs, allowing proliferation on the battlefield. The SMAW is a crew served weapon weighing 30-34 lbs with a reusable launcher. There are 18 SMAW launchers per infantry battalion and the HEAA round will provide an antiarmor capability for the fielded system.

## **7. TECHNICAL FEASIBILITY AND ENERGY/ENVIRONMENTAL IMPACTS**

a. **Technical Feasibility.** A Naval Surface Weapons Center, Dahlgren Technical Report of August 1974 indicated that nine different types of warheads and six launcher systems had been evaluated for the Marine Corps. As a result of those evaluations, the SMAW concept was shown to be feasible. Subsequently, advanced development efforts for the warhead and fuze were completed during 1980. By mating the proven MK 118, Mod 0, HE Dual-Mode SMAW warhead and the dual-mode fuze with an existing Israeli B300 launcher and propulsion device, the technical risk was minimized. Subsequently, the SMAW successfully passed the MSARC milestones and was released for production. Development of an HEAA round for the system is also considered a low technical risk program.

b. Energy/Environmental Impacts. The small amount of explosive and rocket propellant used in the 83 millimeter SMAW warhead and rocket will have no significant impact upon the environment, and no impact on the consumption of energy.

8. LIFE CYCLE COST FORECAST. See annex A.

9. MANPOWER REQUIREMENTS. The SMAW will be fielded in the assault section, weapons platoon, rifle company of the infantry battalion which is currently structured with seven enlisted personnel. As part of the Ground Force Structure Enhancement Program the assault section will be expanded to a 13-man section in fiscal years 1990 and 1991 with the addition of six 0351 ammunition bearers. This will require an additional 486 Marines for the regular force.

10. TRAINING REQUIREMENTS. Operation of the SMAW will not involve the application of unusual infantry skills, nor require exceptional training support requirements. The use of the 9mm spotting rifle which is an integral part of each launcher provides an inexpensive means for the SMAW gunner to acquire the familiarization and resultant skill with which to bring the 83mm main round on target. Initial training of 0351 SMAW gunners will be done at the Infantry Training Schools.

11. AMPHIBIOUS/STRATEGIC LIFT IMPACT. The SMAW must be capable of transport by all means currently available to the Marine Corps to include existing amphibious shipping, all helicopters, and cargo aircraft including the MV-22A Osprey.

Major System: SIW

Date: 0. 16. 85

**LIFE CYCLE COST FORECAST**  
**FUNDING PROFILE**  
(In Thousands of FY86 Constant Budget Dollars)  
**20 YEAR LIFE CYCLE**

|                        | PRELIM.<br>YEARS | CURRENT<br>YEAR | PROJECT<br>YEAR | FY87   | FY88   | FY89   | FY90   | FY91   | TO<br>COMPLETION | TOTAL<br>PROGRAM |
|------------------------|------------------|-----------------|-----------------|--------|--------|--------|--------|--------|------------------|------------------|
| Major System           |                  |                 |                 |        |        |        |        |        |                  |                  |
| ROCKET                 | 18,762           | 4,941           | 16,704          | 4,300  | 4,200  | 5,900  | 6,500  | 3,500  | 10,000           | 74,807           |
| INF                    | 32,447           | 72,410          | 71,659          | 51,645 | 77,800 | 77,382 | 80,479 | 83,822 | 618,764          | 1,166,408        |
| QYSS FUNDED            |                  |                 |                 |        |        |        |        |        |                  |                  |
| o HEAVY/CAL Warhead    |                  |                 |                 |        |        |        |        |        |                  |                  |
| 9mm Spot Rd.           | 0                | 0               | 0               | 0      | 6,932  | 6,899  | 7,141  | 6,864  | 0                | 27,835           |
| Practice Rd.           | 0                | 0               | 0               | 0      | 32,760 | 32,760 | 32,760 | 32,760 | 524,160          | 655,200          |
| o Launcher             | 825              | 600             | 435             | 0      | 0      | 0      | 0      | 0      | 0                | 1,860            |
| o Dual Purpose Warhead | 7,714            | 52,272          | 48,984          | 26,195 | 23,519 | 22,033 | 22,021 | 21,483 | 0                | 224,221          |
| 9mm Spot Rd            | 123,840          | 71,280          | 67,880          | 50,799 | 65,184 | 65,184 | 65,184 | 65,184 | 847,392          | 1,421,727        |
| Practice Rd            | 11,893           | 14,724          | 15,360          | 14,254 | 25,750 | 24,860 | 25,091 | 25,973 | 337,649          | 493,554          |
| Support                |                  |                 |                 |        |        |        |        |        |                  |                  |
| INF                    | 0                | 0               | 0               | 0      | 0      | 0      | 0      | 0      | 0                | 0                |
| SHUTTLE                | 0                | 0               | 0               | 0      | 0      | 0      | 0      | 0      | 0                | 0                |
| CRAM                   | 0                | 0               | 0               | 0      | 0      | 0      | 0      | 0      | 50,000           | 50,000           |
| QYSS                   | 0                | 0               | 0               | 0      | 0      | 0      | 0      | 0      | 187,910          | 187,910          |
| NAVY INF               | 0                | 0               | 0               | 0      | 0      | 0      | 0      | 0      | 0                | 0                |
| TOTAL PROGRAM          | 51,209           | 77,151          | 88,163          | 55,945 | 82,000 | 81,282 | 86,979 | 87,422 | 869,764          | 1,482,205        |

- This document should not be associated with any RM or FYDP budget document. The "To Completion" column represents the difference between the funding stream (established or purposed) and the Total Life Cycle cost column which is the life cycle cost of the program by appropriation.

All costs associated with the Launcher were obtained from the cost documents provided to the ISAC III decision.

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ANNEX A

Major System: SMW

Date: 07-16-85

LIFE CYCLE COST ESTIMATE  
(In Thousands of FY86 Constant Budget Dollars)

20 YEAR LIFE CYCLE

| PHASE/CATEGORY                                      | SUBCATEGORY | CATEGORY  | PHASE     |
|---|-------------|-----------|-----------|
| I. RDT&E PHASE                                      |             |           | 74,807    |
| II. INVESTMENT PHASE                                |             |           | 1,169,603 |
| 1. SYSTEM PRODUCTION/PROCUREMENT                    |             | 1,169,603 |           |
| A. Major End Item (Contractor)                      | 1,164,605   |           |           |
| B. Initial Provisioning/Spares, Repair Parts        | 1,803       |           |           |
| C. Government Furnished/Added Equipment             | 0           |           |           |
| D. Other Direct System Costs                        | 3,195       |           |           |
| 2. SUPPORT EQUIPMENT PROCUREMENT                    |             | 0         |           |
| A. Ammunition                                       | 0           |           |           |
| B. Weapons and Tracked Combat Vehicles              | 0           |           |           |
| C. Guided Missiles                                  | 0           |           |           |
| D. Comm-Elec Equipment                              | 0           |           |           |
| E. Support Vehicles                                 | 0           |           |           |
| F. Engineer and Other Equipment                     | 0           |           |           |
| 3. MILITARY CONSTRUCTION                            |             | 0         |           |
| III. OPERATIONS AND SUPPORT PHASE                   |             |           | 237,795   |
| 1. OPERATIONS                                       |             | 224,425   |           |
| A. Operator Personnel/Training                      | 186,105     |           |           |
| B. Material Consumption                             | 38,320      |           |           |
| C. Energy Consumption                               | 0           |           |           |
| 2. MAINTENANCE                                      |             | 12,091    |           |
| A. Organizational Maintenance                       | 10,854      |           |           |
| 1) Personnel/Training                               | 1,498       |           |           |
| 2) Maintenance Material                             | 0           |           |           |
| 3) Repair Material                                  | 9,356       |           |           |
| 4) Other  | 0           |           |           |
| B. Intermediate Maintenance                         | 1,237       |           |           |
| 1) Personnel/Training                               | 307         |           |           |
| 2) Maintenance Material                             | 0           |           |           |
| 3) Repair Material                                  | 523         |           |           |
| 4) Other  | 407         |           |           |
| C. Depot Repair                                     | 0           |           |           |
| D. Depot Overhaul                                   | 0           |           |           |
| E. Unprogrammed Losses                              | 0           |           |           |
| F. Software Maintenance                             | 0           |           |           |
| 3. INDIRECT SUPT, BASE OPS & MAINT, OTHER O/H COSTS |             | 1,279     |           |
| A. Base Operations                                  | 1,279       |           |           |
| B. Other Overhead Costs                             | 0           |           |           |
| 4. SUPPORT EQUIPMENT O & S                          |             | 0         |           |
| TOTAL LIFE CYCLE COSTS                              |             |           | 1,482,205 |

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